

# OPERATING INSTRUCTIONS AND SERVICE MANUAL

## Cleco<sup>®</sup>

55NAL-1-270-4

55NL-1-724-4

55RNL-2-LS-4-13

| COMPLETE TOOL   |          |
|-----------------|----------|
| MODEL NO.       | CODE NO. |
| 55NAL-1-270-4   | 230270   |
| 55NL-1-724-4    | 220724   |
| 55RNL-2-LS-4-13 | 240389   |

## OPERATING INSTRUCTIONS

### 55 CLECOMATIC NUTRUNNERS

The 55 Cleomatic nutrunner is designed to operate on 90 psig maximum air pressure but does not depend on controlled air pressure to maintain accurate torque. Accurate torque is achieved by setting the Cleomatic clutch to the desired torque on the application. The tool will shut off automatically at this torque. Releasing the throttle will allow the tool to reset for the next cycle.

**CAUTION** If the clutch is adjusted over the maximum power output of the tool, the clutch will not function and the tool will operate like a stall-type tool. Also, if the tool is being operated at its upper torque limits, a drop in air pressure could cause the clutch not to function due to a loss of motor power and the tool will function like a stall-type tool. If the tool stalls the operator must resist the stall torque until he releases the throttle.

Operational check: Grip tool securely and be prepared to counteract stall torque in case clutch is improperly adjusted. THIS IS A HIGH TORQUE TOOL.

### CLECOMATIC CLUTCH ADJUSTMENT

Depress the pin, No. 864711, and rotate the adjustment cover, No. 867677, 180 degrees so it lines up with the adjustment slot. With the angle head end of the tool facing outward, away from the operator, use a 1/8" diameter pin to rotate the adjustment nut, No. 867678, clockwise to increase the torque and counterclockwise to decrease the torque. Note: The steel ball, No. 844077, is a positive lock for the adjustment nut and must be in place in a locking slot before the adjusting cover is rotated to the locked position after each clutch adjustment is completed.

### METERING VALVE

The metering nut No. 203203, can be adjusted with a hex wrench clockwise to lower the RPM of the tool or counter-clockwise to raise the RPM of the tool.

### THROTTLE POSITION

The throttle lever or button may be repositioned to accomodate proper location for task and to avoid entrapment. Repositioning of the angle head is done by loosening housing lock nut No. 867521, and lifting the angle head until the spline on the angle head clears the gear case and can be rotated to the position desired. Lower the angle head back into place and tighten housing lock nut.

### AIR SUPPLY

For maximum performance, use a 1/2" I.D. air hose no longer than 8' in length. If additional length is required, a 5/8" or larger hose should be connected to the 1/2" hose.

The air hose should be cleared of accumulated dirt and moisture, then one (1) teaspoon of 10W machine oil should be poured into the tool's air inlet before connecting the hose to the tool.

### LUBRICATION

An automatic in-line filter-lubricator is recommended as it increases tool life and keeps the tool in sustained operation. The in-line lubricator should be regularly checked and filled with a good grade of 10W machine oil. Proper adjustment of the in-line lubricator is performed by placing a sheet of paper next to the exhaust ports and holding the throttle open approximately 30 seconds. The lubricator is properly set when a light stain of oil collects on the paper. Excessive amounts of oil should be avoided.

Application of the tool should govern how frequently it is greased. It is recommended that the idler gears receive a generous amount of No. 2 Moly grease when tool is disassembled.

### STORAGE

In the event that it becomes necessary to store the tool for an extended period of time (overnight, weekend, etc.), it should receive a generous amount of lubrication at that time and again when returned to service. The tool should be stored in a clean and dry environment.

## SERVICE INSTRUCTIONS

### DISASSEMBLY — GENERAL—Stall Tools

To disassemble the tool, clamp the spindle housing adaptor lightly in a soft-jawed vise with the tool in a horizontal position. Using a suitable wrench, unscrew the motor housing. Using a suitable wrench, unscrew the spindle housing (left hand threads). Be careful not to lose any gear train components. Using a soft-faced mallet, tap the front of the motor housing to remove the motor unit.

### Automatic Shut-Off Tools

To disassemble the tool, clamp the flats of the clutch housing in a soft-jawed vise and unscrew the motor housing. Clamp the spindle housing adaptor in the vise and unscrew the spindle housing (left hand threads). Using a suitable wrench, unscrew the clutch housing from the spindle housing adaptor. Be careful not to lose any gear train components. Tap the front of the motor housing with a soft-faced mallet to remove the motor unit.

## SUBASSEMBLY DISASSEMBLY

### Gear Train

Clamp spindle housing adaptor, in vise and uncrew spindle housing (left hand threads). Remove spider 869905, out rear of spindle housing. Remove bearing retainer 869877 and bearing retainer ring 882115, to release spindle. Clamp clutch housing in vise (if tool is equipped with clutch) and unscrew spindle housing adaptor 203696. 1st reduction spider 861485, will fall out rear. The 2nd reduction spider 203698, can now be removed from bearing 865198. The bearing can also be removed for inspection. By driving the idler gear pins out of the rear of the spiders, the idler gears can be removed from the spider pockets.

### Clecomatic Clutch

Remove the adjustment cover by sliding it off the back of the clutch housing. Be careful not to lose the steel ball, No. 844077, that will drop out at this time. Using the slots provided on the rear face of the adjusting nut, No. 867678, unscrew it from the clutch housing. The torque spring bearing, No. 867683, spring plate, No. 867669, and torque spring, No. 869626, will come out through the rear of the clutch housing. With a soft mallet, tap on the gear end of the clutch to remove it from the clutch housing. By removing the retainer ring, No. 847022, the drive shaft washer, No. 867666, trip sleeve spring, No. 202056, trip sleeve, No. 867670 and two (2) steel balls, No. 842161, can be removed from the drive shaft. Remove the clutch cam bearing, No. 619377, with a suitable puller. Using a sharp instrument, remove the spiral ring, No. 865436. This will allow the clutch cam, No. 867676, three (3) steel balls, No. 842161, trip plunger spring, No. 867671 and trip plunger, No. 867668, to be removed through the front of the drive shaft. To remove the six (6) steel balls, No. 844265, slide the ball retainer, No. 867673, off over the rear of the drive shaft.

### Motor Unit

Remove bearing cap. Clamp the cylinder lightly in the vise with the gear end of the rotor up. Note: The rotor pinion, No. 867524, used on the -4 and -6 models should be removed at this time. Drive the rotor out of the front rotor bearing, No. 619377. Be careful not to damage the rotor. The front bearing plate, No. 867536, cylinder, and rotor blades, can now be removed from the rotor. Clamp the body of the rotor in the vise with the rear bearing plate up. After unscrewing the bearing lock nut, No. 865352, the rotor can be driven out of the rear rotor bearing.

## REASSEMBLY

The tool is reassembled in the reverse order of disassembly. Clean all parts thoroughly in a solvent and inspect for damage or wear. Check all bearings for wear which can be detected by excessive end play and/or roughness which

would indicate a brinelled condition. The rotor blades should be replaced at every repair cycle or if they measure less than 1/4" at either end. All gear teeth, bearings, and pins should receive a close inspection and be replaced if necessary.

### Motor Reassembly

To assemble the motor, install the rear rotor bearing into the rear bearing plate. Make sure the outer bearing race is firmly seated in the bearing plate. Clamp the rotor body lightly in the vise with the threaded end up and slip the rear bearing plate assembly onto the rotor shaft far enough for the bearing lock nut to start. Tighten the lock nut until there is approximately .0015" clearance between the rotor and bearing plate. The outer bearing race should be firmly seated and the rotor bumped forward when checking this clearance. Pack both rotor bearings with a good grade of No. 2 Moly grease after assembly of the motor unit. Note: During reassembly of the complete tool, it is important that the motor be free. After the tool is completely assembled, the right angle square drive spindle should turn freely using a small hand wrench. If the spindle does not turn freely, the motor should be checked for proper spacing. Do not run the tool until the spindle turns freely. Failure to do this could result in damage to motor components.

During reassembly of the gear train and head, all of the various gears and bearings should receive a generous amount of No. 2 Moly grease.

The Clecomatic clutch is assembled in the reverse order of disassembly. The torque spring bearing, No. 867683, must be assembled so the solid side of the ball separator is facing toward the torque spring.

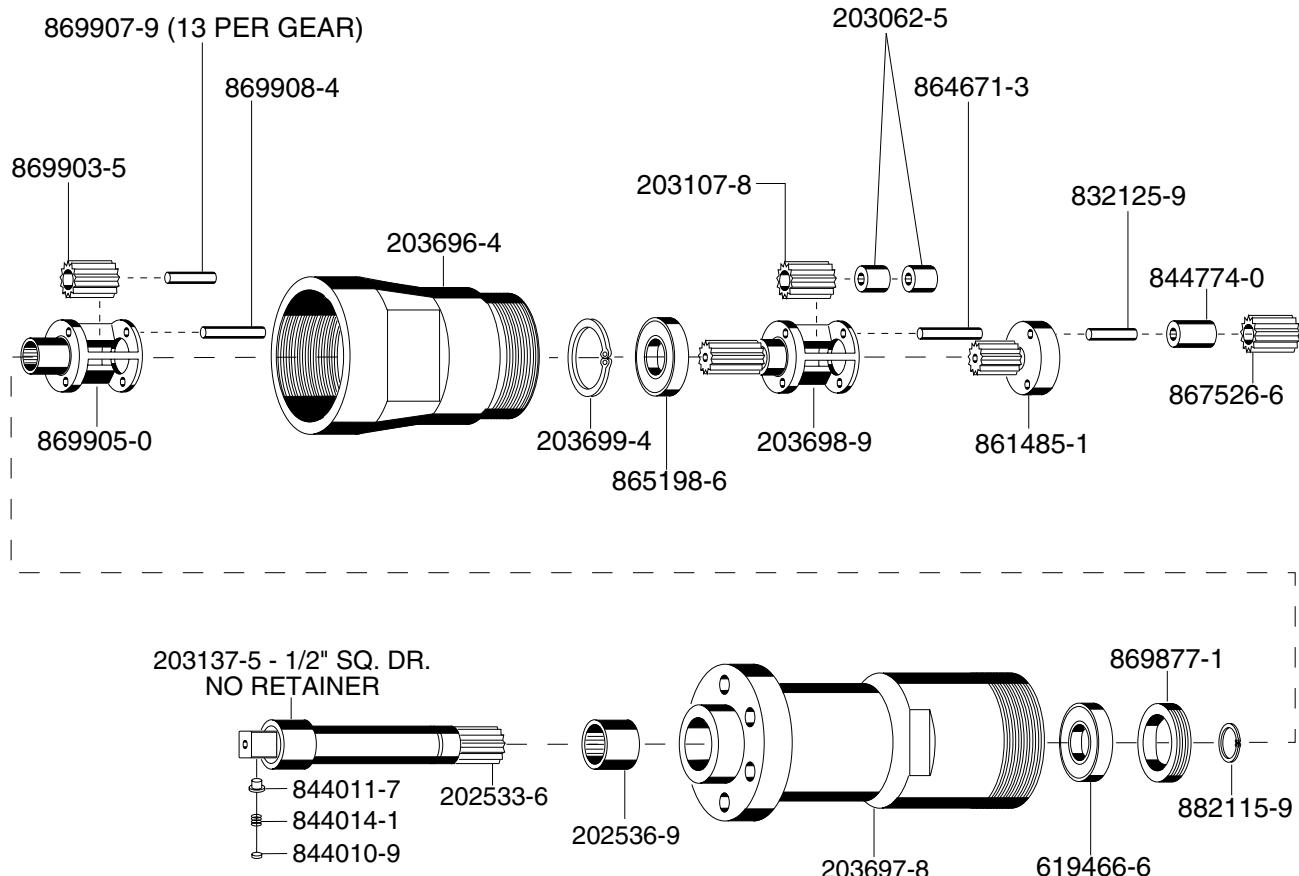
During reassembly on the automatic shut-off tools, the tip rod must be ground flush (+0 to -1/32) with the hex end of the rotor. Hold the motor firmly in the housing at the time the trip rod is being sized to length.

Pour a few drops of 10W machine oil into the air inlet after complete assembly to insure immediate lubrication of all motor parts when air is applied.

### SAFETY CHECK

After repair or replacement of parts, tools equipped with an automatic shut-off device should be tested to verify that they are functioning properly.

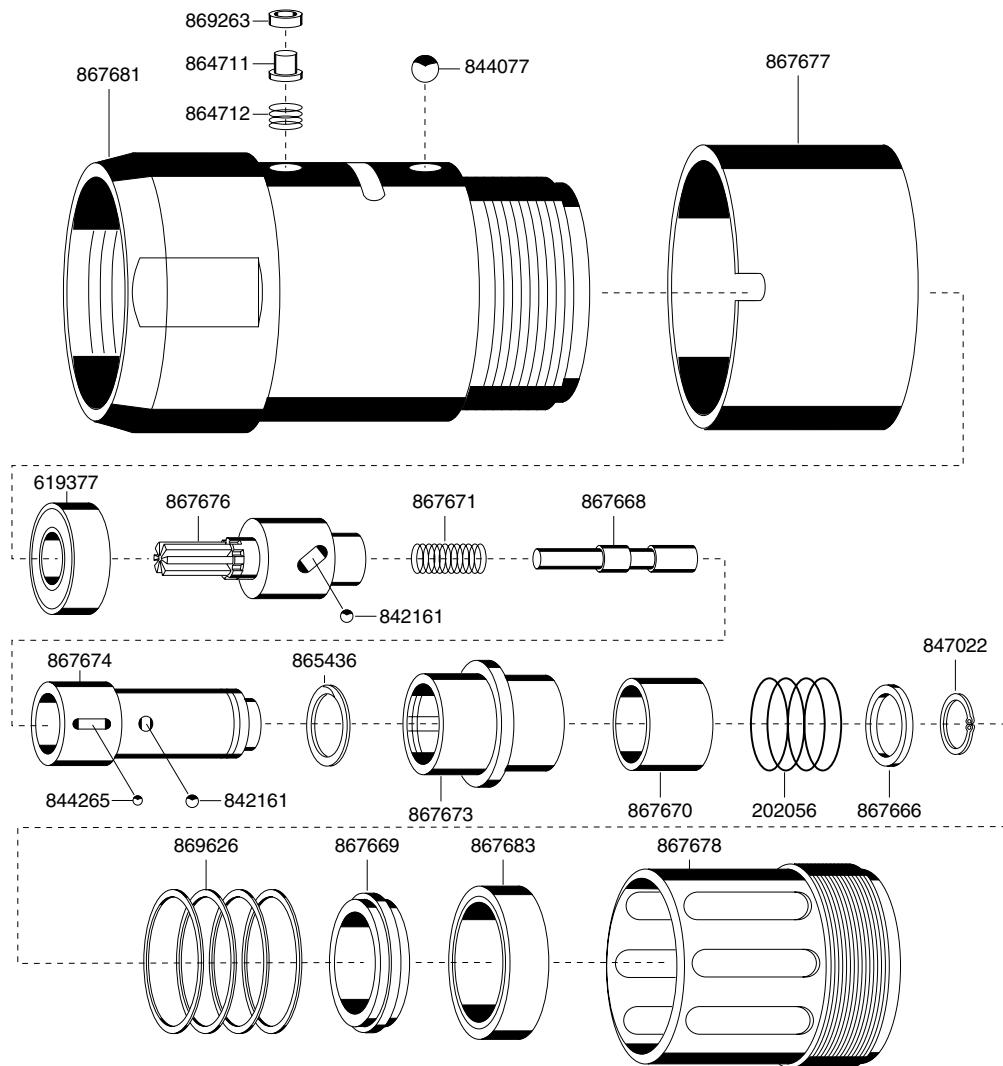
## NO. 55NAL-1 & 55NL-1 NUTRUNNER GEAR TRAINS



### PARTS LIST — GEAR TRAIN

| PART NO. | NAME OF PART                            | QTY. | PART NO. | NAME OF PART                                   | QTY. |
|----------|---|------|----------|--|------|
| 202533   | Spindle (incl. 844010, 844011 & 844014) | 1    | 844014   | Lock Pin Spring                                | 1    |
| 202536   | Spindle Needle Bearing                  | 1    | 844774   | 1st Red. Idler Gear Bearing                    | 3    |
| 203062   | 2nd Red. Idler Gear Bearing             | 6    | 861485   | 1st Red. Spider-19T (incl. 832125)             | 1    |
| 203107   | 2nd Red. Idler Gear-15T (incl. 203062)  | 3    | 864671   | 2nd Red. Idler Gear Pin                        | 3    |
| 203137   | Spindle                                 | 1    | 865198   | 2nd Red. Spider Ball Bearing                   | 1    |
| 203696   | Spindle Housing Adaptor                 | 1    | 867526   | 1st Red. Idler Gear Bearing-21T (incl. 844774) | 3    |
| 203697   | Spindle Housing                         | 1    | 869877   | Spindle Ball Bearing Retainer Ring             | 1    |
| 203698   | 2nd Red. Spider-19T                     | 1    | 869903   | 3rd Red. Idler Gear-15T                        | 3    |
| 203699   | Retainer Ring                           | 1    | 869905   | 3rd Red. Spider                                | 1    |
| 619466   | Spindle Ball Bearing                    | 1    | 869907   | 3rd Red. Needle Roller                         | 39   |
| 832125   | 1st Red. Gear Pin                       | 3    | 869908   | 3rd Red. Idler Gear Pin                        | 3    |
| 844010   | Spring Retainer                         | 1    | 882115   | Spindle Retainer Ring                          | 1    |
| 844011   | Socket Lock Pin                         | 1    |          |  |      |

## NO. 55 NAL-1 CLECOMATIC CLUTCH

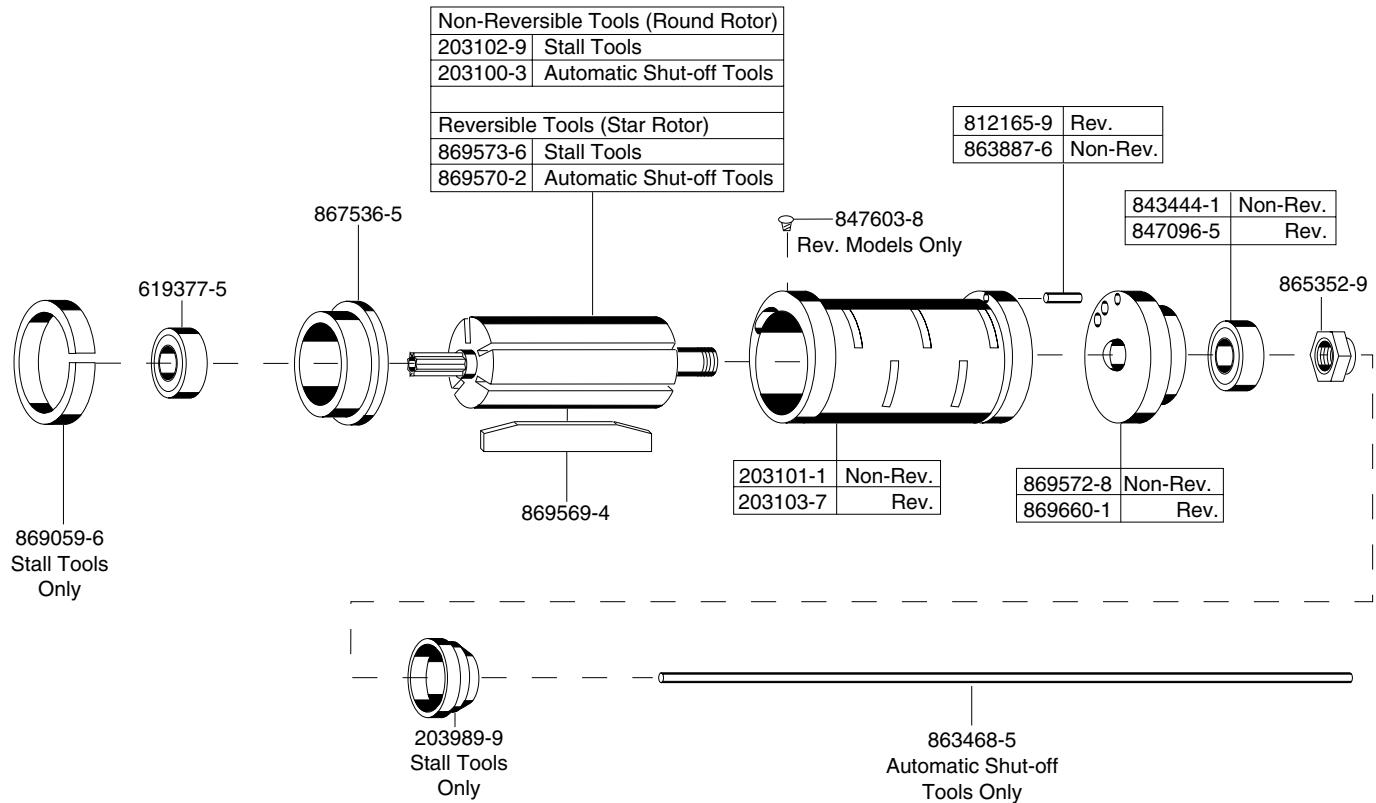


### PARTS LIST — CLECOMATIC CLUTCH

| PART NO. | NAME OF PART          | QTY. | PART NO. | NAME OF PART                                  | QTY. |
|----------|-----------------------|------|----------|---|------|
| 202056   | TRIP SLEEVE SPRING    | 1    | 867670   | TRIP SLEEVE                                   | 1    |
| 619377   | CLUTCH CAM BEARING    | 1    | 867671   | TRIP PLUNGER SPRING                           | 1    |
| 842161   | STEEL BALL 3/16" DIA. | 5    | 867673   | BALL RETAINER                                 | 1    |
| 844077   | STEEL BALL 5/16" DIA. | 1    | 867674   | DRIVE SHAFT                                   | 1    |
| 844265   | STEEL BALL 1/8" DIA.  | 6    | 867676   | CLUTCH CAM                                    | 1    |
| 847022   | WASHER RETAINER RING  | 1    | 867677   | ADJUSTMENT HOLE COVER                         | 1    |
| 864711   | PIN                   | 1    | 867678   | ADJUSTMENT NUT                                | 1    |
| 864712   | PIN SPRING            | 1    | 867681   | CLUTCH HOUSING (INCL. 864711, 864712, 869263) | 1    |
| 865436   | SPIRAL RING           | 1    | 867683   | TORQUE SPRING BEARING                         | 1    |
| 867666   | DRIVE SHAFT WASHER    | 1    | 869263   | PIN SLEEVE                                    | 1    |
| 867668   | TRIP PLUNGER          | 1    | 869266   | TORQUE SPRING                                 | 1    |
| 867669   | TORQUE SPRING PLATE   | 1    |          |   |      |

The complete clutch with housing can be purchased as a sub-assembly using Part No. 861847.

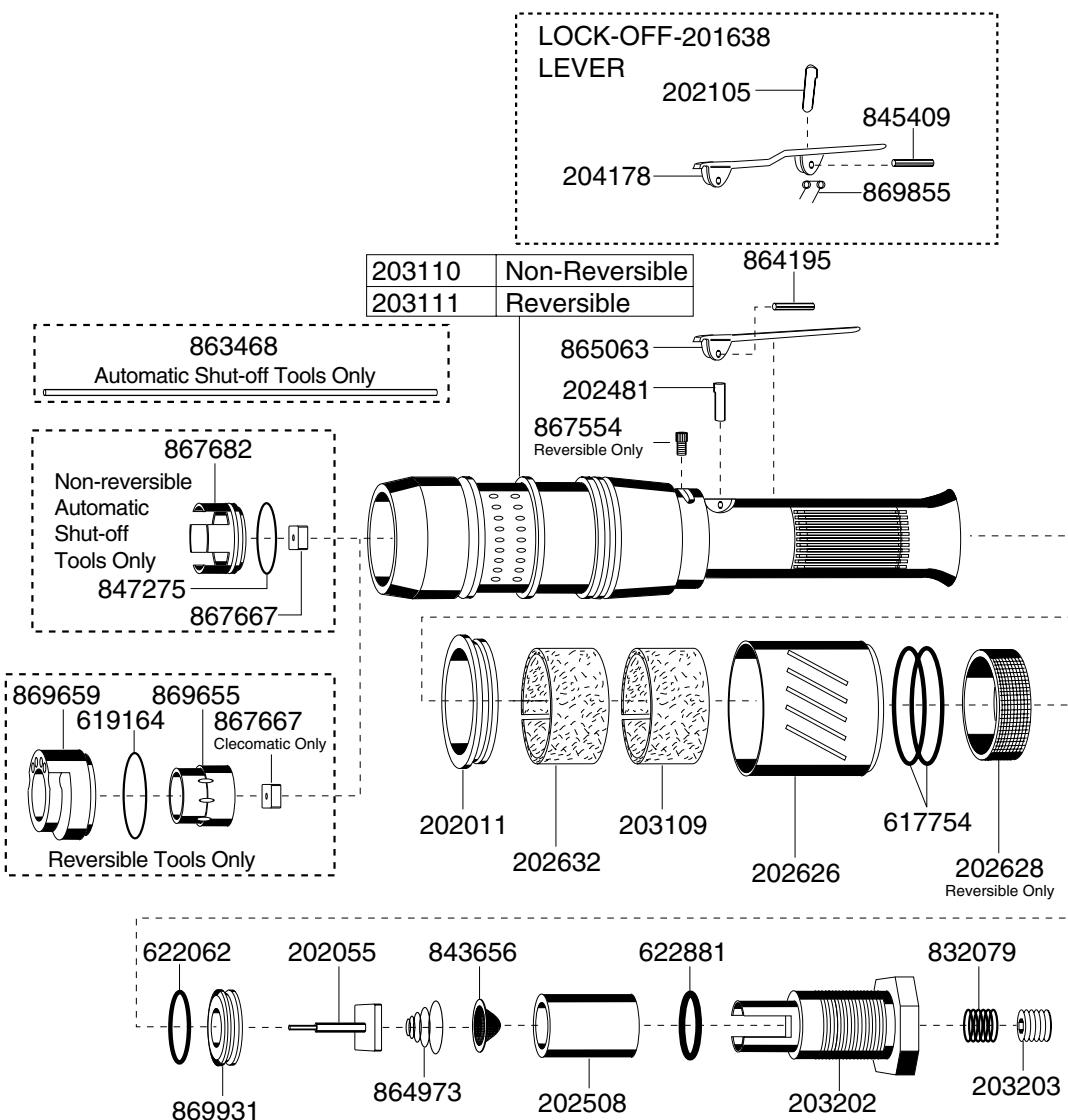
# NO. 55NAL-1 & 55NL-1 MOTOR



## PARTS LIST — MOTOR

| PART NO. | NAME OF PART                              | QTY. |
|----------|---|------|
| 203100   | ROTOR-HEX (NON-REV. AUTOMATIC SHUT-OFF)   | 1    |
| 203101   | CYLINDER (NON-REVERSIBLE) - INCL. 8863887 | 1    |
| 203102   | ROTOR-7T (NON-REVERSIBLE STALL)           | 1    |
| 203103   | CYLINDER (REVERSIBLE) - INCL. 812164      | 1    |
| 203989   | BEARING CAP (STALL TOOL ONLY)             | 1    |
| 619377   | FRONT ROTOR BEARING                       | 1    |
| 812165   | REVERSIBLE CYLINDER PIN                   | 1    |
| 843444   | REAR ROTOR BEARING (NON-REVERSIBLE)       | 1    |
| 847096   | REAR ROTOR BEARING (REVERSIBLE)           | 1    |
| 847603   | ALIGNMENT PIN (REVERSIBLE)                | 1    |
| 863468   | TRIP ROD (AUTOMATIC SHUT-OFF)             | 1    |
| 863887   | NON-REVERSIBLE CYLINDER PIN               | 1    |
| 865352   | ROTOR LOCK NUT                            | 1    |
| 867536   | FRONT BEARING PLATE                       | 1    |
| 869059   | MOTOR SPACER (STALL ONLY)                 | 1    |
| 869569   | ROTOR BLADE                               | 5    |
| 869660   | REAR BEARING PLATE (REVERSIBLE)           | 1    |
| 869570   | ROTOR-HEX (REVERSIBLE AUTOMATIC SHUT-OFF) | 1    |
| 869572   | REAR BEARING PLATE (NON-REVERSIBLE)       | 1    |
| 869573   | ROTOR-7T (REVERSIBLE STALL)               | 1    |

## NO. 55 NAL-1 & NL-1 HANDLE



### PARTS LIST — HANDLE

| PART NO. | NAME OF PART              | QTY. | PART NO. | NAME OF PART                     | QTY. |
|----------|---------------------------|------|----------|----------------------------------|------|
| 202011   | SEAL RING                 | 1    | 622881   | "O"-RING 7/8" X 1-1/8"           | 1    |
| 202055   | THROTTLE VALVE            | 1    | 832079   | SPRING                           | 1    |
| 202105   | LOCK-OFF LEVER PAWL       | 1    | 843656   | AIR INLET SCREEN                 | 1    |
| 202481   | THROTTLE VALVE PIN        | 1    | 845409   | LOCK-OFF LEVER PAWL RETAINER PIN | 1    |
| 202508   | INLET SPACER              | 1    | 847275*  | "O"-RING 1-1/16" X 1-3/16"       | 1    |
| 202626   | EXHAUST DEFLECTOR         | 1    | 863468*  | TRIP ROD                         | 1    |
| 202628   | REVERSING VALVE SLEEVE    | 1    | 864195   | LEVER PIN                        | 1    |
| 202632   | MUFFLER                   | 1    | 864973   | THROTTLE VALVE SPRING            | 1    |
| 203109   | MUFFLER                   | 1    | 865063   | THROTTLE LEVER                   | 1    |
| 203110   | MOTOR HOUSING (NON-REV.)  | 1    | 867554   | REVERSING VALVE SCREW            | 1    |
| 203111   | MOTOR HOUSING (REV.)      | 1    | 867667*  | SHUT-OFF VALVE                   | 1    |
| 203202   | INLET BUSHING             | 1    | 867682*  | VALVE BLOCK                      | 1    |
| 203203   | METERING NUT              | 1    | 869655   | MOTOR SPACER                     | 1    |
| 204178   | LOCK-OFF LEVER            | 1    | 869659   | REVERSING VALVE                  | 1    |
| 617754   | "O"-RING 2" X 2-1/8"      | 2    | 869855   | LOCK-OFF LEVER SPRING            | 1    |
| 619164   | "O"-RING 1-9/16" X 1-3/4" | 1    | 869931   | THROTTLE VALVE SEAT              | 1    |
| 622062   | "O"-RING 7/8" X 1-1/16"   | 1    |          |                                  |      |

\* Denotes parts not included in subassemblies listed below.

**55NL-1-724**

| PART NO. | NAME OF PART         | QTY. |
|----------|----------------------|------|
| 202011   | SEAL RING            | 1    |
| 202055   | VALVE, THROTTLE      | 1    |
| 202105   | TOGGLE               | 1    |
| 202481   | T.V. PIN             | 1    |
| 202508   | INLET SPACER         | 1    |
| 202536   | SPINDLE BEARING      | 1    |
| 202626   | DEFLECTOR, EXHAUST   | 1    |
| 202632   | MUFFLER              | 1    |
| 203101   | CYLINDER             | 1    |
| 203102   | ROTOR                | 1    |
| 203107   | IDLER GEAR, 2ND RED. | 3    |
| 203109   | MUFFLER              | 1    |
| 203110   | HANDLE               | 1    |
| 203137   | SPINDLE              | 1    |
| 203696   | GEAR CASE            | 1    |
| 203697   | GEAR CASE            | 1    |
| 203698   | 2ND. RED. SPIDER     | 1    |
| 203699   | RETAINING RING       | 1    |
| 203989   | BEARING CAP          | 1    |
| 204178   | LOCK-OFF LEVER       | 1    |
| 617754   | RING, O              | 2    |
| 619377   | BEARING, BALL        | 1    |
| 619466   | BEARING, BALL        | 1    |
| 622062   | RING, O              | 1    |
| 622881   | RING, O              | 1    |
| 843444   | BEARING, BALL        | 1    |
| 843656   | SCREEN               | 1    |
| 845409   | PIN, SPRING          | 1    |
| 861485   | SPIDER, OPEN         | 1    |
| 864195   | PIN, SLOTTED SPRING  | 1    |
| 864671   | PIN, DOWEL           | 3    |
| 864973   | SPRING               | 1    |
| 865198   | BEARING, BALL        | 1    |
| 865352   | NUT, LOCK            | 1    |
| 867526   | IDLER GEAR 121T)     | 3    |
| 867536   | PLATE, FRONT BEARING | 1    |
| 869059   | MOTOR SPACER         | 1    |
| 869569   | BLADE, ROTOR         | 5    |
| 869572   | PLATE, REAR BEARING  | 1    |
| 869855   | TOGGLE SPRING        | 1    |
| 869877   | BEARING RETAINER     | 1    |
| 869903   | GEAR, IDLER          | 3    |
| 869905   | SPIDER, CAGE         | 1    |
| 869907   | ROLLER, NEEDLE       | 39   |
| 869908   | SHAFT, GEAR          | 3    |
| 869931   | THROTTLE VALVE SEAT  | 1    |
| 869933   | INLET BUSHING        | 1    |
| 882115   | RETAINER RING        | 1    |